

Claims

1 1. A method for re-mapping packet identifier (PID)
2 values provided in transport packets associated with
3 multiple transport streams to be multiplexed onto a single
4 shared transport channel, said method comprising:

5 providing at least one PID re-map table having re-
6 map values indexed by n possible PID values of
7 transport packets associated with at least one
8 transport stream of the multiple transport streams,
9 wherein n is less than all possible PID values of
10 transport packets within said multiple transport
11 streams; and

12 comparing PID values of transport packets
13 associated with said at least one transport stream with
14 said n possible PID values of said at least one PID re-
15 map table, and when a match is found, indexing said at
16 least one PID re-map table using said matching PID
17 value, generating therefrom a re-map value, and
18 replacing said matching PID value by said re-map value.

1 2. The method of claim 1, further comprising when a
2 non-matching PID value is found, replacing said non-matching
3 PID value with a null value, meaning that the associated
4 transport packet is to be discarded.

1 3. The method of claim 1, wherein said single shared
2 transport channel couples to a transport demultiplexor, and
3 wherein said transport demultiplexor can handle x PID
4 values, and $n \leq x$.

1 4. The method of claim 3, wherein said n possible PID
2 values equals 32 possible PID values.

1 5. The method of claim 1, further comprising
2 receiving said multiple transport streams from multiple
3 network interfaces, each network interface being coupled to
4 receive a separate network input.

1 6. The method of claim 5, further comprising
2 interleaving said multiple transport streams on a packet
3 basis for output onto said single shared transport channel.

1 7. The method of claim 6, further comprising
2 buffering selected transport packets of said multiple
3 transport streams prior to interleaving thereof to ensure
4 each packet is complete before interleaving.

1 8. The method of claim 1, wherein said multiple
2 transport streams comprise two transport streams, and
3 wherein said method comprises providing a separate PID re-
4 map table for each of said two transport streams, and
5 comparing PID values of transport packets associated with
6 each of said two transport streams with entries of said
7 respective PID re-map tables.

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1 9. The method of claim 8, further comprising
2 receiving said two transport streams for re-mapping, wherein
3 each transport stream contains a real time clock reference.

1 10. The method of claim 1, wherein said multiple
2 transport streams include navigation tables indicative of
3 the PID values in use by the respective transport streams,
4 and wherein said method further comprises monitoring said
5 navigation tables and adjusting said n possible PID values
6 of transport packets responsive to changes in said
7 navigation tables.

1 11. The method of claim 1, further comprising
2 receiving said multiple transport streams and synchronizing
3 each stream to identify packet boundaries.

1 12. The method of claim 11, wherein said receiving
2 comprises receiving at least one transport stream of the
3 multiple transport streams through a network interface, said
4 at least one transport stream comprising a live network
5 input.

1 13. The method of claim 12, wherein at least one
2 transport stream of said multiple transport streams
3 comprises a transport stream retrieved from a storage device
4 associated with a transport demultiplexor coupled to receive
5 said interleaved transport packets.

1 14. The method of claim 1, further in combination with
2 performing clock recovery on the at least one transport
3 stream, and wherein said re-mapping method comprises when a
4 non-matching PID value is found, discarding the transport
5 packet associated with the said non-matching PID value.

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1 15. A method for processing transport packets
2 associated with multiple transport streams, said method
3 comprising:

4 re-mapping packet identifier (PID) values provided
5 in transport packets associated with at least one
6 transport stream of the multiple transport streams,
7 said re-mapping comprising:

8 providing at least one PID re-map table
9 having re-map values indexed by n possible PID
10 values of transport packets associated with at
11 least one transport stream of the multiple
12 transport streams, wherein n is less than all
13 possible PID values of transport packets within
14 said multiple transport streams;

15 comparing PID values of transport packets
16 associated with said at least one transport stream
17 with said n possible PID values of said at least
18 one PID re-map table, and when a match is found,
19 indexing said at least one PID re-map table using
20 said matching PID value, generating therefrom a
21 re-map value, and replacing said matching PID
22 value by said re-map value.

23 interleaving selected transport packets of said
24 multiple transport streams;

25 forwarding said interleaved transport packets of
26 said multiple transport streams to a single transport
27 demultiplexor; and

28 demultiplexing said interleaved transport packets
29 of said multiple transport streams employing said
30 single transport demultiplexor.

1 16. The method of claim 15, wherein said interleaving
2 comprises interleaving said multiple transport streams on a
3 packet basis for output to said single transport
4 demultiplexor.

1 17. The method of claim 16, further comprising
2 buffering said selected transport packets prior to
3 interleaving thereof to ensure each packet is complete
4 before interleaving.

1 18. The method of claim 15, further comprising
2 receiving said multiple transport streams and synchronizing
3 each stream to identify packet boundaries.

1 19. The method of claim 18, wherein said receiving
2 comprises receiving said multiple transport streams for
3 multiple network interfaces, each network interface being
4 coupled to receive a separate live network input.

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1 20. The method of claim 18, wherein said receiving
2 comprises receiving at least one transport stream of
3 multiple transport streams through a network interface, said
4 at least one transport stream comprising a live network
5 input.

1 21. The method of claim 20, wherein at least one
2 transport stream of said multiple transport streams
3 comprises a transport stream retrieved from a storage device
4 associated with said single transport demultiplexor.

1 22. The method of claim 15, wherein said method is
2 implemented within a set-top-box system.

1 23. The method of claim 15, further comprising when a
2 non-matching PID value is found, replacing said non-matching
3 PID value with a null value, meaning that the associated
4 transport packet is to be discarded.

1 24. The method of claim 15, wherein said transport
2 demultiplexor can handle x PID values, and $n \leq x$.

1 25. The method of claim 15, wherein said multiple
2 transport streams include navigation tables indicative of
3 the PID values in use by the respective transport streams,
4 and wherein said method further comprises monitoring said
5 navigation tables and adjusting said n possible PID values
6 of transport packets responsive to changes in said
7 navigation tables.

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1 26. A system of re-mapping packet identifier (PID)
2 values provided in transport packets associated with
3 multiple transport streams to be multiplexed onto a single
4 shared transport channel, said system comprising:

5 means for providing at least one PID re-map table
6 having re-map values indexed by n possible PID values
7 of transport packets associated with at least one
8 transport stream of the multiple transport streams,
9 wherein n is less than all possible PID values of
10 transport packets within said multiple transport
11 streams; and

12 means for comparing PID values of transport
13 packets associated with said at least one transport
14 stream with said n possible PID values of said at least
15 one PID re-map table, and when a match is found, for
16 indexing said at least one PID re-map table using said
17 matching PID value, generating therefrom a re-map
18 value, and replacing said matching PID value by said
19 re-map value.

1 27. The system of claim 26, further comprising when a
2 non-matching PID value is found, means for replacing said
3 non-matching PID value with a null value, meaning that the
4 associated transport packet is to be discarded.

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1 28. The system of claim 26, wherein said single shared
2 transport channel couples to a transport demultiplexor, and
3 wherein said transport demultiplexor can handle x PID
4 values, and $n \leq x$.

1 29. The system of claim 28, wherein said n possible
2 PID values equals 32 possible PID values.

1 30. The system of claim 26, further comprising means
2 for receiving said multiple transport streams from multiple
3 network interfaces, each network interface being coupled to
4 receive a separate network input.

1 31. The system of claim 30, further comprising means
2 for interleaving said multiple transport streams on a packet
3 basis for output onto said single shared transport channel.

1 32. The system of claim 31, further comprising means
2 for buffering selected transport packets of said multiple
3 transport streams prior to interleaving thereof to ensure
4 each packet is complete before interleaving.

1 33. The system of claim 26, wherein said multiple
2 transport streams comprise two transport streams, and
3 wherein said system comprises means for providing a separate
4 PID re-map table for each of said two transport streams, and
5 for comparing PID values of transport packets associated
6 with each of said two transport streams with entries of said
7 respective PID re-map tables.

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1 34. The system of claim 33, further comprising means
2 for receiving said two transport streams for re-mapping,
3 wherein each transport stream contains a real time clock
4 reference.

1 35. The system of claim 26, wherein said multiple
2 transport streams include navigation tables indicative of
3 the PID values in use by the respective transport streams,
4 and wherein said system further comprises means for
5 monitoring said navigation tables and adjusting said n
6 possible PID values of transport packets responsive to
7 changes in said navigation tables.

1 36. The system of claim 26, further comprising means
2 for receiving said multiple transport streams and for
3 synchronizing each stream to identify packet boundaries.

1 37. The system of claim 36, wherein said means for
2 receiving comprises means for receiving at least one
3 transport stream of the multiple transport streams through a
4 network interface, said at least one transport stream
5 comprising a live network input.

1 38. The system of claim 37, wherein at least one
2 transport stream of said multiple transport streams
3 comprises a transport stream retrieved from a storage device
4 associated with a transport demultiplexor coupled to receive
5 said interleaved transport packets.

1 39. The system of claim 26, further comprising means
2 for performing clock recovery on the at least one transport
3 stream, and when a non-matching PID value is found, means
4 for discarding the transport packet associated with the non-
5 matching PID value.

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1 40. A system for processing transport packets
2 associated with multiple transport streams, said system
3 comprising:

4 means for re-mapping packet identifier (PID)
5 values provided in transport packets associated with at
6 least one transport stream of the multiple transport
7 streams, said means for re-mapping comprising:

8 means for providing at least one PID re-map
9 table having re-map values indexed by n possible
10 PID values of transport packets associated with at
11 least one transport stream of the multiple
12 transport streams, wherein n is less than all
13 possible PID values of transport packets within
14 said multiple transport streams;

15 means for comparing PID values of transport
16 packets associated with said at least one
17 transport stream with said n possible PID values
18 of said at least one PID re-map table, and when a
19 match is found, for indexing said at least one PID
20 re-map table using said matching PID value,
21 generating therefrom a re-map value, and replacing
22 said matching PID value by said re-map value;

23 means for interleaving selected transport packets
24 of said multiple transport streams;

25 means for forwarding said interleaved transport
26 packets of said multiple transport streams to a single
27 transport demultiplexor; and

28 wherein said transport demultiplexor comprises
29 means for demultiplexing said interleaved transport
30 packets of said multiple transport streams.

1 41. The system of claim 40, wherein said means for
2 interleaving comprises means for interleaving said multiple
3 transport streams on a packet basis for output to said
4 single transport demultiplexor.

1 42. The system of claim 41, further comprising means
2 for buffering said selected transport packets prior to
3 interleaving thereof to ensure each packet is complete
4 before interleaving.

1 43. The system of claim 40, further comprising means
2 for receiving said multiple transport streams and
3 synchronizing each stream to identify packet boundaries.

1 44. The system of claim 43, wherein said means for
2 receiving comprises means for receiving said multiple
3 transport streams for multiple network interfaces, each
4 network interface being coupled to receive a separate live
5 network input.

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1 45. The system of claim 43, wherein said means for
2 receiving comprises means for receiving at least one
3 transport stream of multiple transport streams through a
4 network interface, said at least one transport stream
5 comprising a live network input.

1 46. The system of claim 45, wherein at least one
2 transport stream of said multiple transport streams
3 comprises a transport stream retrieved from a storage device
4 associated with said single transport demultiplexor.

1 47. The system of claim 40, wherein said system is
2 implemented within a set-top-box system.

1 48. The system of claim 40, further comprising when a
2 non-matching PID value is found, means for replacing said
3 non-matching PID value with a null value, meaning that the
4 associated transport packet is to be discarded.

1 49. The system of claim 40, wherein said transport
2 demultiplexor can handle x PID values, and $n \leq x$.

1 50. The system of claim 40, wherein said multiple
2 transport streams include navigation tables indicative of
3 the PID values in use by the respective transport streams,
4 and wherein said system further comprises means for
5 monitoring said navigation tables and adjusting said n
6 possible PID values of transport packets responsive to
7 changes in said navigation tables.

1 51. A system for processing transport packets
2 associated with multiple transport streams to be multiplexed
3 into a single transport demultiplexor, said system
4 comprising:

5 at least one PID re-map table having re-map values
6 indexed by n possible PID values of transport packets
7 associated with at least one transport stream of the
8 multiple transport streams, wherein n is less than all
9 possible PID values of transport packets within the
10 multiple transport streams; and

11 a controller that compares PID values of transport
12 packets associated with said at least one transport
13 stream with said n possible PID values of said at least
14 one PID re-map table, and when a match is found,
15 indexes said at least one PID re-map table using said
16 matching PID value, generates therefrom a re-map value,
17 and replaces said matching PID value by said re-map
18 value.

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1 52. A system for processing transport packets
2 associated with multiple transport streams, said system
3 comprising:

4 re-mapping logic that re-maps packet identifier
5 (PID) values provided in transport packets associated
6 with at least one transport stream of the multiple
7 transport streams, said re-mapping logic comprising:

8 at least one PID re-map table having re-map
9 values indexed by n possible PID values of
10 transport packets associated with at least one
11 transport stream of the multiple transport
12 streams, wherein n is less than all possible PID
13 values of transport packets within the multiple
14 transport streams;

15 a controller that compares PID values of
16 transport packets associated with said at least
17 one transport stream with said n possible PID
18 values of said at least one PID re-map table, and
19 when a match is found, indexes said at least one
20 PID re-map table using said matching PID value,
21 generates therefrom a re-map value, and replaces
22 said matching PID value by said re-map value;

23 a multiplexor for interleaving selected transport
24 packets of said multiple transport streams; and

25 a transport demultiplexor coupled to said
26 multiplexor for receiving said interleaved transport
27 packets of said multiple transport streams for
28 demultiplexing said interleaved transport packets.

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1 53. A least one program storage device readable by a
2 machine, tangibly embodying at least one program of
3 instructions executable by the machine to perform a method
4 for re-mapping packet identifier (PID) values provided in
5 transport packets associated with multiple transport streams
6 to be multiplexed onto a single shared transport channel,
7 said method comprising:

8 providing at least one PID re-map table having
9 re-map values indexed by n possible PID values of
10 transport packets associated with at least one
11 transport stream of the multiple transport streams,
12 wherein n is less than all possible PID values of
13 transport packets within said multiple transport
14 streams; and

15 comparing PID values of transport packets
16 associated with said at least one transport stream with
17 said n possible PID values of said at least one PID re-
18 map table, and when a match is found, indexing said at
19 least one PID re-map table using said matching PID
20 value, generating therefrom a re-map value, and
21 replacing said matching PID value by said re-map value.

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1 54. The at least one program storage device of claim
2 53, further comprising when a non-matching PID value is
3 found, replacing said non-matching PID value with a null
4 value, meaning that the associated transport packet is to be
5 discarded.

1 55. The at least one program storage device of claim
2 53, wherein said single shared transport channel couples to
3 a transport demultiplexor, and wherein said transport
4 demultiplexor can handle x PID values, and $n \leq x$.

1 56. The at least one program storage device of claim
2 55, wherein said n possible PID values equals 32 possible
3 PID values.

1 57. The at least one program storage device of claim
2 53, further comprising receiving said multiple transport
3 streams from multiple network interfaces, each network
4 interface being coupled to receive a separate network input.

1 58. The at least one program storage device of claim
2 57, further comprising interleaving said multiple transport
3 streams on a packet basis for output onto said single shared
4 transport channel.

1 59. The at least one program storage device of claim
2 58, further comprising buffering selected transport packets
3 of said multiple transport streams prior to interleaving
4 thereof to ensure each packet is complete before
5 interleaving.

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1 60. The at least one program storage device of claim
2 53, wherein said multiple transport streams comprise two
3 transport streams, and wherein said method comprises
4 providing a separate PID re-map table for each of said two
5 transport streams, and comparing PID values of transport
6 packets associated with each of said two transport streams
7 with entries of said respective PID re-map tables.

1 61. The at least one program storage device of claim
2 60, further comprising receiving said two transport streams
3 for re-mapping, wherein each transport stream contains a
4 real time clock reference.

1 62. The at least one program storage device of claim
2 53, wherein said multiple transport streams include
3 navigation tables indicative of the PID values in use by the
4 respective transport streams, and wherein said method
5 further comprises monitoring said navigation tables and
6 adjusting said n possible PID values of transport packets
7 responsive to changes in said navigation tables.

1 63. The at least one program storage device of claim
2 53, further comprising receiving said multiple transport
3 streams and synchronizing each stream to identify packet
4 boundaries.

64. The at least one program storage device of claim 53, further comprising performing clock recovery on the at least one transport stream, and when a non-matching PID value is found, discarding the transport packet associated with said non-matching PID value.

1 65. The at least one program storage device of claim
2 64, wherein said receiving comprises receiving at least one
3 transport stream of the multiple transport streams through a
4 network interface, said at least one transport stream
5 comprising a live network input.

1 66. The at least one program storage device of claim
2 65, wherein at least one transport stream of said multiple
3 transport streams comprises a transport stream retrieved
4 from a storage device associated with a transport
5 demultiplexor coupled to receive said interleaved transport
6 packets.

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1 67. At least one program storage device readable by a
2 machine tangibly embodying at least one program of
3 instructions executable by the machine to perform a method
4 of processing transport packets associated with multiple
5 transport streams, said method comprising:

6 re-mapping packet identifier (PID) values provided
7 in transport packets associated with at least one
8 transport stream of the multiple transport streams,
9 said re-mapping comprising:

10 providing at least one PID re-map table
11 having re-map values indexed by n possible PID
12 values of transport packets associated with at
13 least one transport stream of the multiple
14 transport streams, wherein n is less than all
15 possible PID values of transport packets within
16 said multiple transport streams;

17 comparing PID values of transport packets
18 associated with said at least one transport stream
19 with said n possible PID values of said at least
20 one PID re-map table, and when a match is found,
21 indexing said at least one PID re-map table using
22 said matching PID value, generating therefrom a
23 re-map value, and replacing said matching PID
24 value by said re-map value.

25 interleaving selected transport packets of said
26 multiple transport streams;

1 77. The at least one program storage device of claim
2 67, wherein said multiple transport streams include
3 navigation tables indicative of the PID values in use by the
4 respective transport streams, and wherein said method
5 further comprises monitoring said navigation tables and
6 adjusting said n possible PID values of transport packets
7 responsive to changes in said navigation tables.

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